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iCOMP® Index 2.0 reflects the approximate, relative performance of Intel microprocessors on 32-bit applications and benchmarks. It combines five benchmarks: CPUmark32*, Norton SI-32*, SPECint95*, SPECfp95*, and the Intel Media Benchmark. Each processor's rating is calculated only at the time the processor is introduced, using a particular, well-configured, commercially available system. Relative iCOMP Index 2.0 scores and actual system performance may be affected by differences in system hardware (other than microprocessors) or software design and configuration, including MMX™ media enhancement technology-enabled software. Buyers should consult other sources of information, including system benchmarks, to evaluate the performance of systems they are considering purchasing. For more information about iCOMP Index 2.0, including a description of the systems used to calculate ratings, and other information about microprocessor and system performance and benchmarks, visit Intel's World Wide Web site at www.intel.com

The Pocket Guide to the Intel Architecture

Q4/1997



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Who is Intel?

In 1971, Intel introduced the 4004 microprocessor. Since that time, the microprocessor has changed the world. Today, Intel supplies the computing industry with microprocessors to create advanced computing systems, with each generation offering more performance than the previous one.

Today, more than 200 million systems are powered by Intel processors, making the Intel Inside® logo known all over the world.

Intel is recognized as the top manufacturer of semi-conductors worldwide and as a leading designer of networking and communications products.



The processor is the brain of the PC: The **Intel Inside** logo means that the PC is based on a genuine Intel processor. PC buyers look for the logo because it certifies the origin of the processor and stands for software compatibility, quality/reliability and investment protection. In addition, the logo is prominently displayed on most leading PC systems, as well as in thousands of TV and print ads from leading PC companies, making selection easier for the PC purchaser. Intel microprocessors are the primary ingredient in most of the PCs worldwide. Consequently, software developers write, test, and design their applications on PCs based on Intel processors.

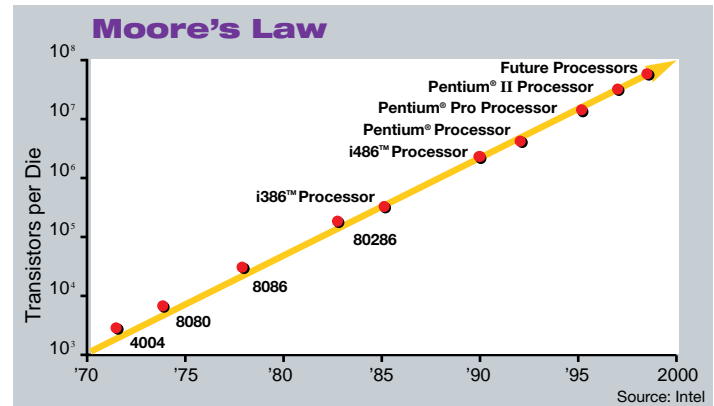
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Technology Evolution

MOORE'S LAW

Moore's Law states that transistor density doubles every 18-24 months, giving chip designers more flexibility to develop increasingly sophisticated processing engines.

With major architecture enhancements such as Dynamic Execution and Intel MMX™ media enhancement technology, microprocessors offer more performance and provide new capabilities. Dynamic Execution is a combination of three processing techniques to speed up software. Intel MMX media enhancement technology enhances multimedia and communications performance.



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Software Evolution



Yesterday's business software was mainly text-based. Today's business software provides many multimedia and communications capabilities. Widespread use of the Internet and corporate intranets also drives the emergence of new software. New applications are changing how people use PCs in business. For example:

- ◆ Videoconferencing allows collaboration through data sharing, real-time video and audio.
- ◆ PC imaging enables capture, edit, share, retrieve, store, and print of high resolution images.

- ◆ New graphics capabilities enhance 3D visualization (data, navigation) and 3D digital content creation (desktop publishing, web authoring, animation).

These demanding applications require today's high performance PCs. Multimedia and communications software reap additional performance benefits from processors with Intel MMX™ media enhancement technology. Users should make sure that their systems have the power to handle the forth-coming enhancements.

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Choosing a new System

To run the latest office suites with additional headroom for even more multimedia and communications applications in the future, choose Pentium® II processor-based desktops. A Pentium II processor-based system provides higher performance, better long term investment and the compatibility you expect from Intel. It features Intel MMX™ technology and uses Dual Independent Bus (D.I.B.) architecture to provide increased throughput for high performance. Entry level desktop users should choose the fastest Pentium processor with MMX technology for a longer useful life. Pentium processor with MMX technology-based systems run faster than Pentium processor-based systems at the same frequency and speed up multimedia and communications even more.

	Market Segment	Operating System	Applications
Pentium® II processor	Business Desktop, Uni/Dual Workstation, Uni/Dual Server	Windows NT*, Windows* 95, UNIX*	Highest performance for Business Apps, Multimedia & Communications, Performance headroom for future Apps
Pentium® Pro processor	Business Desktop, Workstation, Server	Windows NT, Windows 95, UNIX	Great price performance for 32-Bit Business Apps,
Pentium® processor with MMX™ Technology	Home, Mobile, Business Desktop	Windows 95	Business Apps, Consumer Apps, Multimedia & Communications

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New Platform Technologies & Standards



Intel works with other industry leaders, including major telecommunications, PC and software companies, to develop new PC technologies and standards, such as the Desktop Management Interface (DMI), an open architecture standard for managing desktop computers, servers, hardware and software products and peripherals. New technologies also make the PC more “visual” and “connected.” The visual connected PC takes advantage of innovative new media found throughout the Internet and corporate intranets. Thanks to these technologies and standards, PCs continue to evolve, and they deliver more capabilities at reduced costs.

A Few Platform Technologies:

AGP: Accelerated Graphics Port
Enables higher data throughput for more realistic and 3D graphics

DMI: Desktop Management Interface
Remote administration and support of networked PCs

USB: Universal Serial Bus
A single interface for plug-and-play addition of multiple peripheral devices

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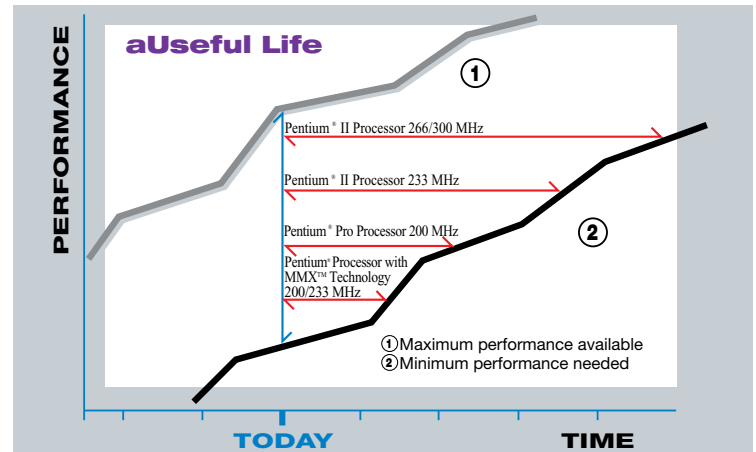
Making the Right Investment

Microprocessors in today's systems should be able to withstand at least one software upgrade without a major loss of software performance.

For desktop users running the latest office suites today and putting in place headroom for advanced business media, communications and Internet capabilities, the Pentium® II processor provides assurance of adequate performance throughout the life of the system.

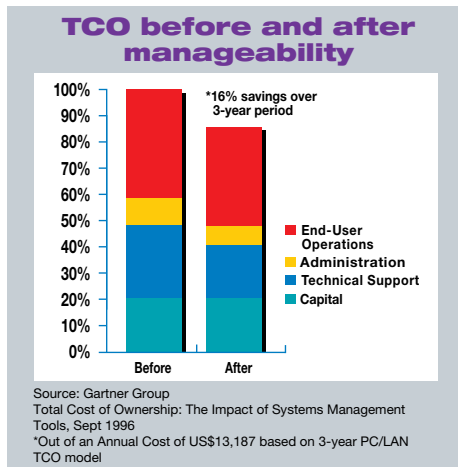
Mobile users should choose Pentium processor with MMX™ technology-based mobile computers for high performance and mobile communications capabilities.

For server and workstation solutions, the Pentium II processor is excellent for uni and dual processing systems, while the Pentium Pro processor is scalable for up to 4-way servers and workstations.



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High-Performance Managed PC



Manageability and the reduction in total cost of ownership (TCO) has become a real focus in the enterprise. Studies from the Gartner Group show that more than three-quarters of TCO comes from technical support, end-user operations and administration. At the same time, end users demand more performance. The solution is the high-performance, managed PC. It allows management tools to obtain systems information and enables remote diagnosis and repair without giving up the PC's flexibility and adaptability. Some elements of the high-performance managed PC are:

- ◆ High-performance microprocessor
- ◆ Advanced 32-bit operating systems

- ◆ Desktop Management Interface (DMI)-enabled components on the motherboard
- ◆ Built-in management hardware, such as thermal and voltage sensors
- ◆ Management software, such as Intel LANDesk® Management Suite
- ◆ Network PCs designed from the ground up to be centrally managed and shipped in sealed chassis to prevent end-user modifications.

According to the Gartner Group, systems management tools can reduce TCO by about 16% on a networked PC over three years – more than the cost of the hardware technology.

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The Changing Role of PCs in Small Business

Small business is the fastest-growing segment of the workforce, and with the right tools, can run circles around their bigger competitors. Those tools include Intel architecture on the desktop, Intel technology in the server and connectivity with Intel networking hardware.

Small businesses need to be connected to respond quickly to customer needs, share information among decision makers, and reach new customers. Getting connected – within an office and to the Internet – is critical to making small businesses operate faster and smarter.

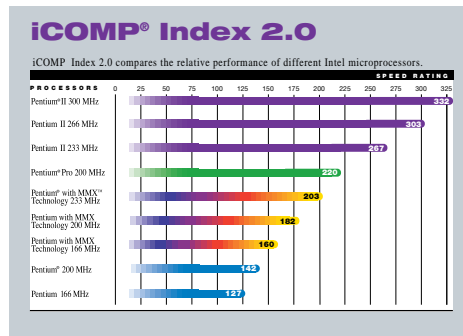
Often, helping a small business install a network and server is the first step. The immediate benefits are centralized file sharing, printer sharing and backup. The next step is to add applications that help the small business take connectivity to the next level– centralized contact management, calendar sharing, e-mail, and world wide web access. Then focus on demonstrating the benefits of powerful Pentium® II processor-based PCs on every desktop to take connectivity to the highest levels.



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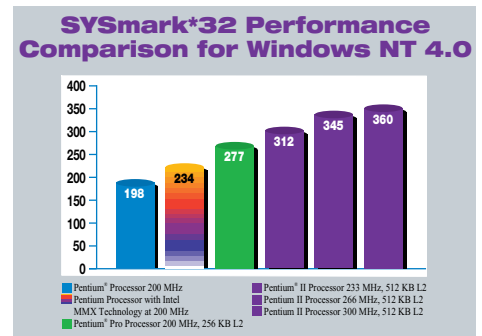
Processor Performance



The iCOMP® Index 2.0 provides a simple measure to compare the relative performance of different Intel microprocessors.

For more information about iCOMP® Index 2.0 refer to back cover.

As businesses look for investment protection and longevity, it makes sense to buy the highest performance available within the desired price range. To truly assess performance over the long run, one should look at measures designed to reflect today's and tomorrow's applications. While integer performance is important for advanced office suites, multimedia performance is important for the increasing use of multimedia video and internet applications in business. Floating point performance measures the processor's performance for 3D and more realistic graphics.



SYSmark® / NT is a suite of application software and associated benchmark scripts designed to measure system performance of personal computers running popular business-oriented applications in the Microsoft Windows NT® operating environment. SYSmark®32 has no Intel MMX™ Technology code. Source: http://channel.intel.com/business/america/ia_chan/

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The Pentium® II Processor Family

The Pentium® II processor, available at 233, 266 and 300 MHz, is the highest performance Intel processor. Its Dual Independent Bus (D.I.B.) architecture and single-edge contact (S.E.C.) cartridge design provide increased throughput for high performance. With excellent performance for office suites and headroom for advanced business media, communications and Internet applications, the Pentium II processor is the choice for business computing environments, such as Windows NT* or Windows* 95. In addition, Pentium II processor-based systems include the latest features to simplify system management.



Dual Independent Bus (D.I.B.) architecture

Pentium® II processor-based systems take advantage of the same high performance Dual Independent Bus (D.I.B.) architecture as the Pentium Pro processor. D.I.B. architecture increases throughput to provide high performance and performance headroom. The Single Edge Contact (S.E.C.) cartridge technology is a packaging technology developed by Intel. Using this technology, the processor and L2 cache components are fully enclosed in a cartridge, which connects to a motherboard via a single edge connector, as opposed to multiple pins. The S.E.C. cartridge brings high performance Dynamic Execution processing and D.I.B. architecture to mainstream systems.



Pentium® II Processor Specification Sheet

CLOCK SPEED (MHz)	233	266	300
BUS SPEED (MHz)	66	66	66
L1 CACHE (I+D)	16K + 16K	16K + 16K	16K + 16K
L2 CACHE	512K	512K	512K
MANUFACTURING PROCESS	0.35 micron	0.35 micron	0.35 micron
iCOMP® INDEX 2.0	267	303	332
PERFORMANCE	<ul style="list-style-type: none">9.49 SPECINT95*6.43 SPECFP95*	<ul style="list-style-type: none">10.80 SPECINT95*6.89 SPECFP95*	<ul style="list-style-type: none">11.7 SPECINT95*8.15 SPECFP95*

Other data, for all Pentium II processors:

Internal Bus Width:	300 Bits	Math Coprocessor Support:	Built-in
External Bus Width:	64 Bits front side, 64 Bits to L2 cache	Dynamic Execution:	Yes
Virtual Addr Space:	64 Terabytes	SuperScalar:	Yes
Physical Addr Space:	64 Gigabytes	CPU Transistors:	~ 7.5 Million
		First-Level Cache Controller:	Built-in
		Second-Level Cache Controller:	Built-in

What is Dynamic Execution? It is the unique combination of three processing techniques the processor uses to speed up software:

Multiple Branch Prediction: First, the processor looks multiple steps ahead in the software and predicts which branches, or groups of instructions, are likely to be processed next. This increases the amount of work fed to the processor.

Dataflow Analysis: Next, the processor analyzes which instructions are dependent on each other's results, or data, to create an optimized schedule of instructions.

Speculative Execution: Instructions are then carried out speculatively based on this optimized schedule, keeping all the chip's processing power busy, and boosting overall software performance.

Intel Architecture-based Workstations and Servers



Available in 233, 266, and 300 MHz, Pentium® II processors offer excellent performance in uni and dual processor server and workstation configurations. The Pentium Pro processor, available in speeds of 166, 180, and 200 MHz, are scaleable up to quad processor configurations for multiprocessing workstations and servers. For high end database servers, a 1 MB level-2 cache is available on the 200 MHz Pentium Pro processor.

Intel architecture-based servers deliver excellent reliability, serviceability and availability. For workstation users, Pentium II and Pentium Pro processor-based systems offer excellent price/performance versus traditional workstations, and have wide industry support on workstation-class software and graphics solutions.



Pentium® Pro Processor Specification Sheet

CLOCK SPEED (MHz)	166	180	200	200	200
BUS SPEED (MHz)	66	60	66	66	66
L1 CACHE (I+D)	8K + 8K	8K + 8K	8K + 8K	8K + 8K	8K + 8K
L2 CACHE	512K	256K	256K	512K	1MB
MANUFACTURING PROCESS	0.35 micron	0.35 micron	0.35 micron	0.35 micron	0.35 micron
iCOMP® INDEX 2.0	N/A†	197	220	N/A†	N/A†
SPECINT95*	• N/A**	• 7.28	• 8.20	• 8.58	• 8.66
SPECFP95*	• N/A**	• 5.59	• 6.21	• 6.48	• 6.80

Other data, for all Pentium Pro processors:

Internal Bus Width:	300 Bits	Math Coprocessor Support:	Built-in
External Bus Width:	64 Bits front side,	Dynamic Execution:	Yes
	64 Bits to L2 cache	SuperScalar:	Yes
Virtual Addr Space:	64 Terabytes	CPU Transistors:	~ 5.5 Million
Physical Addr Space:	64 Gigabytes	First-Level Cache Controller:	Built-in
		Second-Level Cache Controller:	Built-in

† Pentium Pro processors with a 512-Kb L2 cache are designed for server and workstation systems, for which iCOMP Index 2.0 ratings are not relevant.

** Measurements are not available in Pentium® Pro Processor Performance Brief, Sept. 1996.

Source: Performance data are from Pentium Pro Processor Performance Brief, Sept. 1996

The Pentium® Processor with MMX™ Technology Family

Pentium processors with Intel MMX™ technology enable better multimedia and communications performance on applications such as video conferencing and 3D data visualization. Based on industry standard benchmarks, even existing software without MMX technology instructions runs an average of 10-20% faster on a Pentium processor with MMX technology than on Pentium processor-based systems running at the same speed, due to other architectural enhancements such as the larger cache.



What is Intel MMX™ media enhancement technology?

Intel MMX media enhancement technology, which includes 57 new instructions oriented to multimedia and communications data types, is fully compatible with previous Intel architecture processors, yet gives users additional computing power.



The Pentium® Processor with MMX™ Technology Specification Sheet

	Pentium Processor with MMX™ Technology			
CLOCK SPEED (MHz)	150 [†]	166	200	233
BUS SPEED (MHz)	60	66	66	66
CACHE LEVEL 1 (I+D)	16K+16K	16K+16K	16K+16K	16K+16K
MANUFACTURING PROCESS	0.35 micron	0.35 micron	0.35 micron	0.35 micron
iCOMP® INDEX 2.0	144	160	182	203
PERFORMANCE	N/A	• 5.59 SPECINT95* • 4.30 SPECFP95*	• 6.41 SPECINT95* • 4.66 SPECFP95*	• 7.12 SPECINT95* • 5.21 SPECFP95*





Other data, for all Pentium processors with MMX Technology:

Address Bus Width:	32 Bits	Math Coprocessor Support:	Built-in
Data Bus Width:	64 Bits	Dual-Processor enabled:	Yes
Virtual Addr Space:	64 Terabytes	SuperScalar:	Yes
Physical Addr Space:	64 Gigabytes	CPU Transistors:	~ 4.5 Million

Source: Performance data are from Pentium Processor with MMX Technology Performance Brief, Jan. 1997
* Other brands and names are the property of their respective owners.

[†]150-MHz Pentium processor with MMX technology is for mobile computers only





Systems Configurations - Desktop

Entry Level	Midrange	Perf. Midrange	Professional
			
Pentium® Processor with MMX™ Technology 166/200/233 MHz 16 MB/1.6 GB+ HDD 14", 1024 x 768 Full Duplex Audio Mgmt. HW/SW (DMI) Options: 256K L2 12 x CD 10/100 Mb LAN Extd Warranty/Support	Pentium® II Processor 233 MHz Pentium® Pro Processor 200 MHz 24-32 MB/2.0 GB+ HDD, 15", 1024 x 768, USB, Mgmt. HW/SW (DMI) Full Duplex Audio 10/100 Mb LAN Options: 12 x CD Voice C&C plus Headset Extd Warranty/Support	Pentium® II Processor 233/266 MHz 32 MB/3.0 GB+ HDD 17", 1024 x 768, USB 10/100 Mb LAN Mgmt. HW/SW (DMI) Full Duplex Audio 64-bit Graphics 16 x CD Options: Voice C&C plus Headset Video Conferencing HW, App & Camera Extd Warranty/Support	Pentium® II Processor 266/300 MHz 32-64 MB/3.5 GB+ HDD 17", 1024 x 768, USB 10/100 Mb LAN Mgmt. HW/SW (DMI) Full Duplex Audio 64-bit Graphics, 16 x CD Options: SCSI HDD, Voice C&C plus Headset Video Conferencing HW, App & Camera Scanner Extd Warranty/Support

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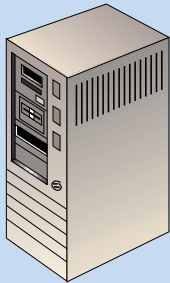
Systems Configurations - Mobile

Entry Level	Midrange	Perf. Midrange	Professional
			
Pentium® Processor with MMX™ Technology 133 MHz 16 MB EDO DRAM 1.6 GB HDD 11.3" DSTN, VGA or 12.1" DSTN, SVGA NiMH 16 bit Audio 8/10 x CD-ROM	Pentium® Processor with MMX Technology 150/166 MHz 256K L2 16 MB EDO DRAM 1.6 GB HDD 12.1" DSTN, SVGA NiMH/Li-Ion 10 x CD-ROM 28.8k Modem Full Duplex Audio	Pentium® Processor with MMX Technology 166/200MHz 256K L2 16/32 MB EDO DRAM/2.0 GB HDD 12.1" TFT, SVGA Li-Ion 10 x CD Full Duplex Audio 33.6k V.80 Modem Cardbus, IR	Pentium® Processor with MMX Technology 200/233 MHz 256K L2 16/32 MB EDO/DRAM/3.0+ GB HDD 13.3" TFT, XGA Li-Ion, Smart Battery 10/12 x CD Full Duplex Audio 33.6k V.80 Modem Cardbus, IR, POTS videoconferencing

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Systems Configurations - Servers

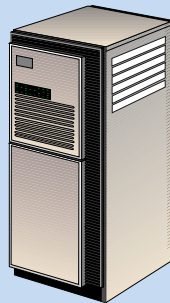
File/Print, Messaging, Intranet Server



Base Configuration:
CPU: Pentium® Pro Processor
180/200 MHz
Cache: 256K/512K
Chip set: 440 FX/LX
of CPU's: 1
Disk: 4.0 GB
Memory: 32 MB
I/O type: 2 ISA, 4 PCI, 1 shared

RAS Features:
Disk: not hot swap
Memory: ECC
PSUs: 1,
of Fans: 1

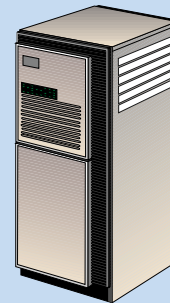
Applications, Messaging, Inter/Intranet Server



Base Configuration:
CPU: Pentium® II Processor
233/266/300 MHz,
Pentium® Pro Processor
166/200 MHz
Cache: 256K/512K
Chip set: 440 FX/LX
of CPU's: 1-2
Disk: 8.0 GB
Memory: 64 MB
I/O type: 2 EISA, 6 PCI,
1 shared, I₂O

RAS Features:
Disk: hot swap option
Memory: ECC
PSUs: N+1, # of Fans: N+1

Database Server



Base Configuration:
CPU: Pentium® Pro Processors
166/200 MHz
Cache: 512K
1MB (200 MHz only)
Chip set: 450 GX
of CPU's: 1-4
Disk: 12.0+ GB
Memory: 128 MB
I/O type: 4 EISA, 6 PCI, I₂O

RAS Features:
Disk: hot swappable
Memory: ECC
PSUs: N+1 (hot swappable)
of Fans: N+1



Check-list

To address total cost of PC ownership...

To adequately handle current applications as well as future upgrades...

For outstanding price/performance and to ensure investment protection...

For excellent server reliability, serviceability and compatibility...

... Choose a platform with the latest manageability features

... Choose a platform with the performance for today's and tomorrow's advanced software environments

... Go for Pentium® II processor-based systems on the desktop and Pentium processors with MMX™ technology for notebooks.

... Choose Intel architecture-based servers. Pentium II processor-based systems offer the highest performance for uni and dual processor servers, while the Pentium® Pro processor is scalable to up to 4-way configurations.



The fastest way to access the most up-to-date information from Intel is to go to www.intel.com on the World Wide Web.